Newtons4th Ltd

Compact Power Analyzers

PPA500 Series DC ~ 500kHz
PPA1500 Series DC ~ 1MHz

High Accuracy - Low
Improved Noise Rejection (PPA500+PPA1500)
Vector Display (PPA1500)

AEROSPACE TESTING | WHITE GOODS TESTING | EN50546+IEC62301 STANDBY POWER | ELECTRIC VEHICLE | UNIVERSITY R+D

Product Overview	
Leading wideband accuracy	Basic 0.05% with class leading high frequency performance
Oscilloscope/Vector Display	PPA1500 features Oscilloscope, Vector and Graphical display
Wide frequency range	DC, 10mHz to 1MHz (DC, 10mHz to 500kHz PPA500)
Fast sample rate and No-Gap	1M samples/s - High accuracy in noisy applications (PPA1500)
Leading phase accuracy	0.005 Degrees plus 0.01 degrees per kHz
Built in high precision current shunt	20Arms, 300Apk or 30Arms 1000Apk direct plus a wide range of external sensors
Versatile interfaces	RS232, USB, LAN as standard, and optional GPIB
Range of PC software options	Remote control, monitoring and recording of real time data, tables and graphs
External Voltage BNC Connector	Unique External BNC connector with high sensitivity to interface with external High Voltage Probes

PPA5/15xx Precision Power Analyzer

PPA500 - DC~500kHz **PPA1500 - DC~1MHz**

FRONT VIEW

① SCREEN DISPLAY OPTIONS

PPA5xx: Zoom, Real time and Table PPA15xx: Zoom, Real Time, Table, **Graph(Vector)**

② MEASUREMENT FUNCTION SELECTION BUTTONS

PPA5xx: POWER ANALYZER, TRUE RMS VOLTMETER, POWER INTEGRATOR, HARMONIC ANALYZER
PPA15xx: PPA5xx Functions PLUS **OSCILLOSCOPE, GRAPHICAL DATALOGGING, HARMONIC BAR CHART, VECTOR**

③ START, STOP, ZERO AND TRIGGER

Trigger button refreshes measurement, Zero resets datalog or allows an offset trim
Start and Stop buttons provide manual control of a measurement period

④ MEASUREMENT SETTINGS BUTTONS

Acquisition settings - Sets wiring configuration, Smoothing and data logging, Set coupling to AC, DC or AC+DC, Range - Internal or external attenuator, autoranging settings, scale factors, Application mode - Ballast, inrush current and standby power

⑤ FRONT USB PORT

USB memory port allows data and colour screen prints to be saved directly to a USB pen drive

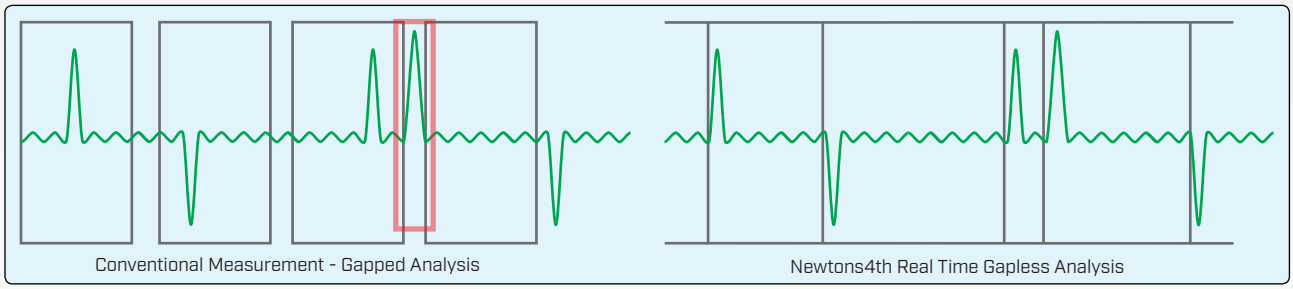
⑥ POWER BUTTON ⑦ MENU SELECTION AND CURSOR CONTROL

⑧ DISPLAY SCREEN

White LED backlit colour TFT display with high contrast and wide viewing angle

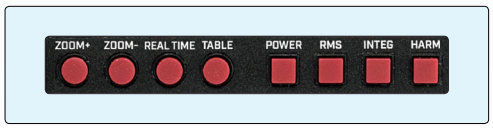
Real Time No Gap Analysis

The PPA5xx/PPA15xx series Power Analyzers use a real time no gap analysis technique unique to Newtons4th that enables real time measurements to be taken with no gap in incoming data from the ADC. This ensures that no events are missed, which is particularly important for the correct measurement of asynchronous

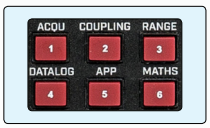


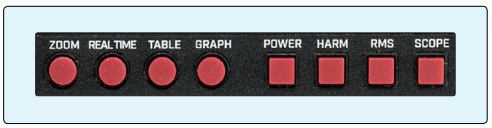
Intuitive User Interface Simplifies Setup

The PPA5xx/PPA15xx user interface has been developed with ease of use in mind. A simple button layout eases setup of the instrument allowing the engineer to commence measurements quickly with



PPA5xx



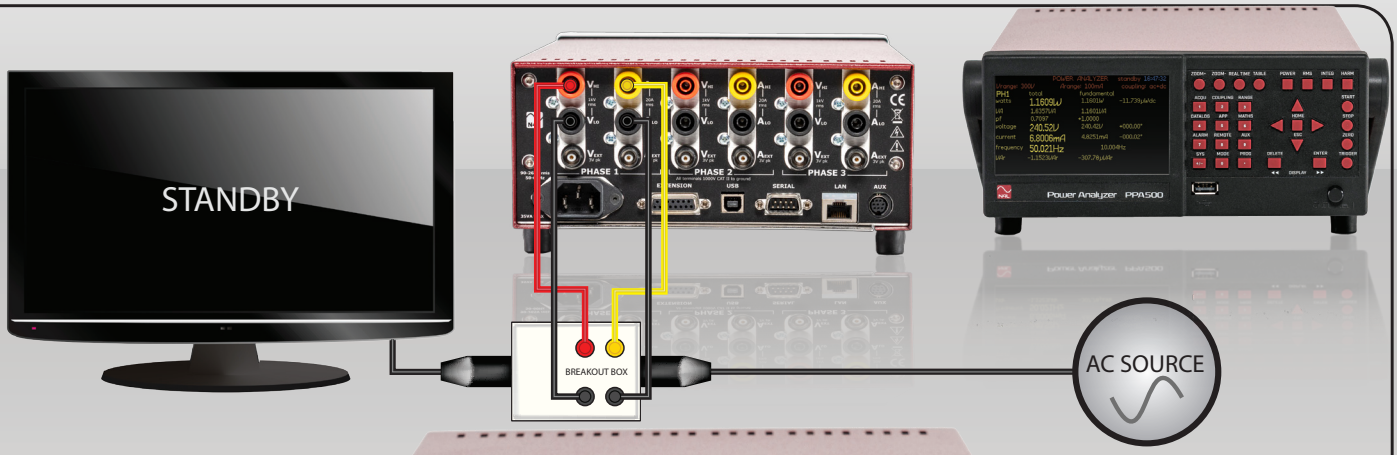


PPA15xx

Example Applications

Example Application : Standby Power Measurement IEC62301/EN50564

The PPA5xx and PPA15xx are the perfect instruments for tests such as EN50564 Standby Power Testing. PC software that provides simple testing and reporting for EN50564 is available free of charge from the N4L website.



Clear, Flexible Display

Backlit LED display with zoom functions to customise the parameters displayed

Front USB Port

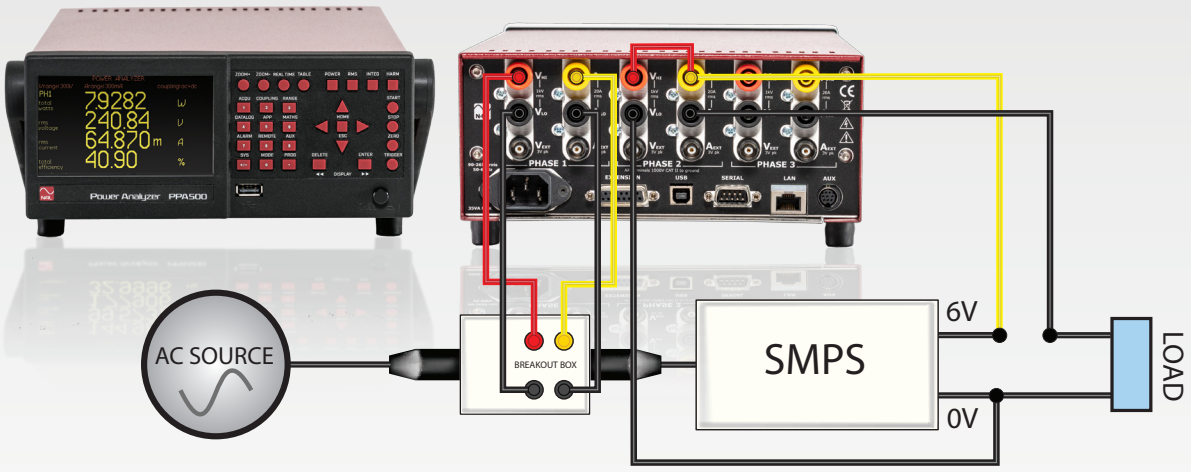
Datalogs, Results and instrument configurations can be saved to internal memory, an external USB device or directly into N4L software.

ENERGY STAR

Meets or exceeds the requirements and methodology of U.S. EPA (Energy Star), U.S.DOE, California Energy Commission (CEC),

Example Application : AC-DC Power Supply Efficiency Testing

The PPA5/1520 or PPA5/1530 can be used in 2 Phase 2 Wattmeter configuration for efficiency testing of power supplies, ballasts and many other devices.



On-screen efficiency readings

The PPA5/1500 instruments can be configured to display the real time efficiency of a system.

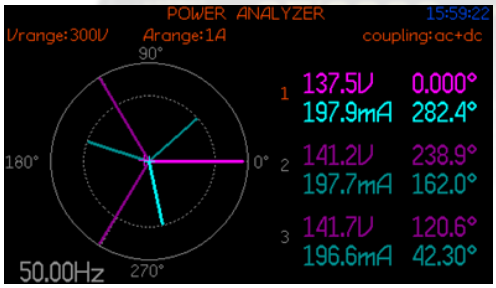
1,2 or 3 Phase measurements

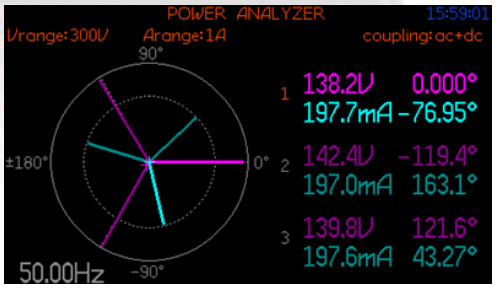
The PPA5/1510 (1 Phase), PPA5/1520 (2 Phase) and PPA5/1530 (3 Phase) use fully isolated and independent measurement channels.

PPA1500 Vector Display / Accessories

PPA1500 Vector Display

The PPA15xx features a vector display offering an excellent insight into the relationship between voltage and current as well as each individual phase of a multi phase system. An intuitive user interface provides the user with an immediate picture of system balance as well as the lead/lag relationship





Accesories

A wide range of accesories are available to extend the capabilities of the PPA500 & PPA1500 ranges. For an up-to-date full range and further information along with datasheets and user manuals please visit the N4l website www.newtons4th.com

High Performance attenuating voltage probes	2.5kV - 15kV
Attenuators for use with voltage probes	X10 & X20
High Performance external current shunts	3Arms - 500Arms
AC Transformer type current clamps	50A - 3kA | 40Hz - 5kHz |600V CAT III
AC+DC Hall Effect current clamps	1A - 5kA | DC - 2kHz | 600V CAT III
AC+DC Zero Flux current transformers	0.01% Accuracy | Range covers 0A - 2kA
Rogowski Coils single & 3 phase	0.05% Accuracy | 1Hz - 1MHz | 5kA & 10kA
Low Pass noise filters	-3dB@ 5kHz ± 1kHz | -3dB@ 50kHz ± 10kHz
Single phase breakout box	Max 13A Universal Socket
CANBUS Interface	
Phase Controlled Inrush Switch (PCIS)	10Arms(300Apk)
Rack Mounting	Left | Right | Centre | Twin variants
Protective Carry cases	Hard & soft available
Wide Range of Free software to download	PPA Datalogger | Standby Power Analysis

Calibration and ISO17025 Certification

UKAS PPA500 PPA1500

Newtons4th are an accredited UKAS Calibration laboratory, all PPA500 and PPA1500 Power Analyzers are supplied with an ISO17025 UKAS Calibration Certifcate as standard. Calibration of N4L Power Analyzers is an integral and important part of our service to our clients, we offer quick turnaround times at a competitive price. Re-Calibration is also available at our international offices and various distributors throughout the world*.

UKAS CALIBRATION 7949

Schedule of Accreditation PPA500 PPA1500

N4L's schedule of accreditation to ISO17025 is wide ranging and an overview of the schedule is detailed below, for more specific information please see the UKAS website to view the full accreditation

ISO17025 UKAS Accreditation Schedule		
	Signal Amplitude	Frequency Range
Voltage Sine Amplitude	1V to 1008V	16Hz to 850Hz
Voltage Harmonic Amplitude	0V to 302V	16Hz to 6kHz
Current Sinewave Amplitude	100mA to 48A	16Hz to 850Hz
Current Harmonic Amplitude	0A to 15A	16Hz to 6kHz
Current to Voltage Phase Angle	-180° to +180°	16Hz to 850Hz
Apparent Power (VA Product)	100mVa to 48.4kVA	16Hz to 850Hz
AC Power	0W to 48.4kW	16Hz to 850Hz
AC Power (Calorimeter)	0W to 5W	45Hz to 2MHz
Current Harmonic Amplitude to IEC61000-4-7	0A to 6A	16Hz to 6kHz
Flicker to IEC61000-4-15	Pinst(Sinusoidal Modulation)	As per IEC61000
	Pinst(Rectangular Modulation)	
	Pst	
	Frequency Changes	
	Distorted Voltage with Multiple Zero Crossings	
	Harmonics with Sidebands	
	Phase Jumps	
	Rectangular Changes with Duty Cycle	
IEC61000-4-15 Impedance Networks	Resistance, Reactance	33 mΩ to 400 Ω

Due to the specialist nature of Power Measurement Instrumentation Calibration, N4L utilise both commercially available calibration equipment (such as the Fluke 6105A for UKAS Certification) along with N4L bespoke designed signal generation equipment in order to calibrate our instruments over the full frequency range (up to 2MHz). Calibration over the full frequency range is uncommon given that such signal generation equipment is not commercially available. When supplied with an N4L analyzer, all customers will receive a calibration certificate covering the complete frequency range.

*UKAS Calibration is available from N4L UK HQ only, details of calibration performed at other locations is subject to local accreditation, please contact your local office for more details.

SPECIFICATION

		PPA500				PPA1500			
Frequency Range									
		Normal	DC#, 10mHz ~ 500kHz			Normal	DC#, 10mHz ~ 1MHz		
		x10	DC#, 10mHz ~ 100kHz			x10	DC#, 10mHz ~ 100kHz		
Voltage Input									
Internal	Range	Normal	1Vpk ~ 2500Vpk(1000Vrms) in 8 ranges			Normal	1Vpk ~ 2500Vpk(1000Vrms) in 8 ranges		
		x10	100mVpk ~ 300Vpk(1000Vrms) in 8 ranges			x10	100mVpk ~ 300Vpk(1000Vrms) in 8 ranges		
	Accuracy	Normal	0.05% Rdg+0.1% Rng+(0.005%×kHz Rdg)+5mV			Normal	0.05% Rdg+0.1% Rng+(0.005%×kHz Rdg)+5mV		
		x10	0.05% Rdg+0.1% Rng+(0.01%×kHz Rdg)+1mV			x10	0.05% Rdg+0.1% Rng+(0.01%×kHz Rdg)+1mV		
External	Range	1mVpk ~ 3Vpk in 8 ranges【BNC connector 3Vpk max input】				1mVpk ~ 3Vpk in 8 ranges【BNC connector 3Vpk max input】			
	Accuracy	0.05% Rdg+0.1% Rng+(0.005%×kHz Rdg)+5uV				0.05% Rdg+0.1% Rng+(0.005%×kHz Rdg)+5uV			
40-850Hz		As per standard spec with Rng error reduced from +0.1% V Rng to 0.05%				As per standard spec with Rng error reduced from +0.1% V Rng to 0.05%			
Current Input									
Internal		20Arms Current Shunt 4mm safety connectors	Ranges	Normal	100mApk ~ 300Apk(20Arms) in 8 ranges	Ranges	Normal	100mApk ~ 300Apk(20Arms) in 8 ranges	
				x10	10mApk ~ 30Apk in 8 ranges		x10	10mApk ~ 30Apk in 8 ranges	
			Accuracy	Normal	0.05% Rdg + 0.1% Rng + (0.005% x kHz Rdg) + 500uA	Accuracy	Normal	0.05% Rdg + 0.1% Rng + (0.005% x kHz Rdg) + 500uA	
				x10	0.05% Rdg + 0.1% Rng + (0.01% x kHz Rdg) + 100uA		x10	0.05% Rdg + 0.1% Rng + (0.01% x kHz Rdg) + 100uA	
		30Arms Current Shunt 4mm safety connectors	Ranges	Normal	300mApk ~ 1000Apk(30Arms) in 8 ranges	Ranges	Normal	300mApk ~ 1000Apk(30Arms) in 8 ranges	
				x10	30mApk ~ 100Apk in 8 ranges		x10	30mApk ~ 100Apk in 8 ranges	
			Accuracy	Normal	0.05% Rdg + 0.1% Rng + (0.005% x kHz Rdg) + 1mA	Accuracy	Normal	0.05% Rdg + 0.1% Rng + (0.005% x kHz Rdg) + 1mA	
				x10	0.05% Rdg + 0.1% Rng + (0.01% x kHz Rdg) + 300uA		x10	0.05% Rdg + 0.1% Rng + (0.01% x kHz Rdg) + 300uA	
External input (External shunt Current sensor)		BNC Connector (Max input 3Vpk)	Ranges	1mVpk ~ 3Vpk in 8 ranges		Ranges	1mVpk ~ 3Vpk in 8 ranges		
			Accuracy	0.05% Rdg+0.1% Rng+(0.005%×kHz Rdg)+ 5µV		Accuracy	0.05% Rdg+0.1% Rng+(0.005%×kHz Rdg)+ 5µV		
40-850Hz		As per standard spec with Rng error reduced from +0.1% A Rng to 0.05%				As per standard spec with Rng error reduced from +0.1% A Rng to 0.05%			
Phase Accuracy									
		Normal	0.01deg+(0.01deg x kHz)			0.01deg+(0.01deg x kHz)			
		x10	0.01deg+(0.02deg x kHz)			0.01deg+(0.02deg x kHz)			
Power Accuracy									
		Normal	[0.1%+0.1%/pf+(0.01%×kHz)/pf] Rdg+0.1%VA Rng			[0.1%+0.1%/pf+(0.01%×kHz)/pf] Rdg+0.1%VA Rng			
		x10	[0.1%+0.1%/pf+(0.02%×kHz)/pf] Rdg+0.1%VA Rng			[0.1%+0.1%/pf+(0.02%×kHz)/pf] Rdg+0.1%VA Rng			
40-850Hz		As per standard spec with Rng error reduced from +0.1% VA Rng to 0.05%				As per standard spec with Rng error reduced from +0.1% VA Rng to 0.05%			
Minimum Current Measurement at Full Accuracy									
PPA5/1500 20A		1mA							
PPA5/1500 30A		3mA							
General									
Crest Factor		20(Voltage and Current)							
Sample Rate		1Ms/s on all channels, No-Gap				1Ms/s on all channels, No-Gap			
IEC Modes		IEC62301/EN50564 Standby Power				IEC62301/EN50564 Standby Power			
Application Modes		Ballast, Inrush, Standby Power				Ballast, Inrush, Standby Power			
CMRR - Common Mode Rejection Ratio									
		250V @ 50Hz - ≥ 1mA (150dB)							
		100V @ 100kHz - ≥ 3mA (130dB)							
Measurement Parameters									
		W, VA, Var, pf, V & A - rms, rectified mean, AC, DC, Peak, Surge, Crest Factor, Form Factor, Star to Delta Voltage, +ve Pk, -ve Pk							
		Frequency (Hz), Phase (deg), Fundamentals, Impedance							
		Harmonics, THD, TIF, THF, TRD, TDD							
		Integrated Values, Datalog, Sum and Neutral values							
Datalog - Up to 4 user selectable measurement functions (60 with PC software)									
Datalog Window		No-Gap analysis, Minimum window 10ms				No-Gap analysis, Minimum window 10ms			
Memory		16,000 records				16,000 records			
Communication Ports									
RS232		Baud rate up to 38.4kbps,RTS/CTS flow control							
LAN		10/100 Base-T Ethernet auto sensing							
GPIB		(Option G) IEEE488.2 Compatible - via external communications box							
USB		USB 2.0 and 1.1 compatible							
Extension		Fitted as Standard							
Standard Accessories									
Leads		Power, RS232, USB				Power, RS232, USB			
Connection Cables		20A (Std version) or 36A (HC version) 1.5m long 4mm stackable terminals 1x red, 1x yellow and 2x black per phase							
Connection Clips		4mm terminated aligator clips - 1x red, 1x yellow and 2x black per phase							
CD-ROM		CommView2 (RS232/USB/LAN), Command line, Script based communication software (Datalogging software available as free of charge download)							
Documents		User manual, Communications manual, Calibration certificate, Quick start guide							
Mechanical/Environmental									
Input Impedance		Voltage Attenuator and External Inputs 1MΩ || 30pF							
Display		480x272 dot full colour TFT, White LED Backlit							
Dimensions		92H×215W×312D mm excluding feet							
Weight		3.3kg(1 Phase), 4kg(3 Phase)							
Safety Isolation		1000Vrms or DC(CATII), 600Vrms or DC(CATIII)							
Power supply		90 ~ 265Vrms, 50 ~ 60Hz, 35VAmax							
Operating Conditions		5 to 40°C Ambient Temperature (or air intake temperature when rack mounted), 20-90% Relative Humidity Non-Condensing. Temperature coefficient ±0.02% per °C of reading at 5-18°C and 28-40°C							
Voltage Attenuator Overload Capacity									
20ms		2.5kV PK (1.5kV rms)							
5sec		2.5kV PK (1.1kV rms)							
Continuous		2.5kV PK (1.0kV rms)							

#DC Specification available separately

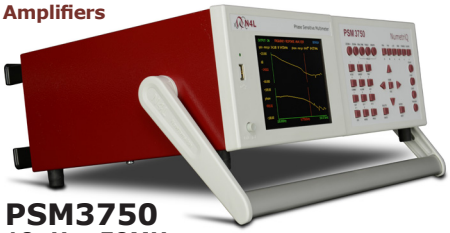
PRODUCT COMPARISON

	PPA500	PPA1500	PPA3500	PPA4500	PPA5500
Basic Accuracy					
V, A rdg error	0.05%	0.05%	0.04%	0.03%	0.01%
Power rdg error	0.10%	0.10%	0.06%	0.04%	0.03%
Phase Options					
Internal	1～3	1～3	1～6	1～3	1～3
Master/Slave operation	—	—	—	4～6	4～6
Bandwidth					
20 & 30A Shunt	DC ～ 500kHz	DC ～ 1MHz	DC ～ 1MHz	—	—
10 & 30A Shunt	—	—	—	DC ～ 2MHz	DC ～ 2MHz
50A Shunt	—	—	—	DC ～ 1MHz	DC ～ 1MHz
Voltage Input					
Max input voltage	2500Vpk (1kVrms)	2500Vpk (1kVrms)	2500Vpk (1kVrms)	3000Vpk (1kVrms)	3000Vpk (1kVrms)
No. of ranges	8	8	8	8	9
Direct Current Input					
10Arms model	—	—	—	O	O
20Arms model	O	O	O	—	—
30Arms model	O	O	O	O	O
50Arms model	—	—	—	O	O
No. of ranges	8	8	8	8	9
Features					
Scope and Graph Modes	—	O	O	O	O
Vector Display	—	O	—	—	—
USB Memory port	O	O	O	O	O
LAN Port	O	O	O	O	O
GPIB Port	O	O	O	O	O
RS232 Port	O	O	O	O	O
Real time clock	O	O	O	O	O
19in Rack mount option	O	O	O	O	O
Torque and Speed	—	—	O	O	O
IEC61000 Mode	—	—	—	—	O
PWM Motor Drive Mode	—	O (Via Parallel Filtering Options)	O	O	O
Oscilloscope/Graphic	—	O	O	O	O
Transformer Mode	—	—	O	O	O
PWM Filter Options	—	2	7	7	7
Speed/Harmonics/Sec	300/sec	300/sec	300/sec	600/sec	1800/sec
Internal Datalogging	4 Parameters	4 Parameters	32 Parameters	16 Parameters	16 Parameters
Datalog Records	16000	16000	5M	5M	10M
ABD0100.1.8 Mode	—	—	—	—	O
Internal Memory	192kB	192kB	500MB	500MB	1GB
Harmonics	50	50	100	100	417
Minimum Window Size	10ms	5ms	5ms	2ms	2ms
Dimensions - Excl. Feet H x W x D (mm)	92 x 215 x 312	92 x 215 x 312	92 x 404 x 346	130 x 400 x 315	130 x 400 x 315
Weight	3.3 - 4kg	3.3 - 4kg	5 - 7kg	5.4 - 6kg	5.4 - 6kg

— Not Applicable O Option O Standard

All specifications at 23°C ± 5°C . These specifications are quoted in good faith but Newtons4th Ltd reserves the right to amend any specification at any time without notice

The N4L product range also includes Frequency Response and Impedance Analyzers, Selective Level Meters and Laboratory Power Amplifiers



PSM3750
10uHz~50MHz

PSM17xx
10uHz~35MHz

Applications

- Power supply phase margin and gain margin (FRA)
- Inductance, Capacitance and Resistance (LCR)
- Analysis of mechanical vibration (HARM)
- Phase Angle Voltmeter (PAV)

Contact your local N4L Distributor for further details

Newtons4th

Newtons4th Ltd (abbreviated to N4L) was established in 1997 to design, manufacture and support innovative electronic equipment to a world-wide market, specialising in sophisticated test equipment particularly related to phase measurement. The company was founded on the principle of using the latest technology and sophisticated analysis techniques in order to provide our customers with accurate, easy to use instruments at a lower price than has been traditionally associated with these types of measurements. Flexibility in our products and an attitude to providing the solutions that our customers really want has allowed us to develop many innovative functions in our ever increasing product range.

Newtons4th Ltd are ISO9001 registered, the internationally recognised standard for the quality management of businesses

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2010

In recognition of the technical innovation and commercial success of the PPA series, N4L received the "Innovation 2010" Queen's award for enterprise

Distributed by:

Newtons4th Ltd
1 Bede Island Road
Leicester
LE2 7EA
UK
Phone: +44 (0)116 230 1066
Email: sales@newtons4th.com
Web: www.newtons4th.com

